Amendments to the Claims:

1.-8. (canceled)

9. (currently amended) ~~A~~ The method ~~for screening a herbicidally active substances which inhibit the activity of plant dihydroorotase~~ of claim 21, ~~which comprises:~~ wherein

~~generating, in a first step,~~ the dihydroorotase ~~using a DNA sequence~~ is generated from expression of SEQ ID NO: 1 ~~or a DNA sequence having a homology of at least 60% with respect to SEQ ID NO: 1 and which encodes a protein which has the enzymatic activity of a dihydroorotase, and,~~

~~in a second step, measuring the activity of the plant dihydroorotase in the presence and absence of a test substanc~~e.

10. (currently amended) ~~A~~ The method as claimed in claim ~~9~~ 21, wherein the plant dihydroorotase is measured in a high-throughput screening ~~(HTS)~~ assay.

11.-13. (canceled)

14. (currently amended) ~~An~~ The assay system of claim 24, wherein the dihydroorotase or the protein having the enzymatic activity of the dihydroorotase for identifying inhibitors of plant dihydroorotase is generated from ~~based on~~ the expression ~~of a DNA sequence~~ of SEQ ID NO: 1 ~~or a DNA sequence having a homology of at least 60% with SEQ ID NO: 1 and encodes a protein having an enzymatic activity of dihydroorotase, for identifying inhibitors of plant dihydroorotase, comprising:~~

~~incubating the protein with a test substance to be studied, and~~

~~after a suitable reaction time, determining the enzymatic activity of the protein in comparison with the activity of the protein in the absence of the test substance~~.

15.-18. (canceled)

19. (previously presented) The method of claim 9 wherein the DNA sequence of SEQ ID NO: 1 encodes a protein which has the enzymatic activity of a dihydroorotase.

20. (previously presented) The method of claim 9, which comprises generating, in the first step, dihydroorotase using the DNA sequence of SEQ ID NO: 1.

21. (previously presented) A method for screening herbicidally active substances which inhibit the activity of plant dihydroorotase, comprising:

generating, in a first step, dihydroorotase or a protein having the enzymatic activity of a dihydroorotase, and

in a second step, measuring activity of the plant dihydroorotase in the presence and absence of a test substance.

22.-23. (canceled)

24. (new) An assay system based on a dihydroorotase or a protein having the enzymatic activity of a dihydroorotase, for identifying inhibitors of plant dihydroorotase, comprising:

incubating the protein with a test substance to be studied, and after a suitable reaction time, determining the enzymatic activity of the protein in comparison with the activity of the protein in the absence of the test substance.

25. (new) The method of claim 21 further comprising:

selecting the test substance which has a herbicidal activity.

26. (new) The method of claim 21 further comprising:

identifying a herbicidally active test substance which inhibits dihydroorotase.

27. (new) The method of claim 21, wherein the activity is measured in a photometric assay.

28. (new) The method of claim 27, wherein the photometric assay is measured in a photometer.

29. (new) The method of claim 27, wherein the photometric assay is read at 340 nm.

30. (new) The method of claim 21, wherein the activity is measured in a colorimetric assay.

31. (new) The method of claim 30, wherein the activity is measured by detecting formation of carbamoyl aspartate.

32. (new) A method for screening herbicidally active substances which inhibit the activity of plant dihydroorotase comprising:

generating a dihydroorotase or a protein having the enzymatic activity of a dihydroorotase;

measuring an activity of the dihydroorotase in the presence and absence of a test substance; and

identifying a herbicidally active test substance which inhibits the dihydroorotase, wherein the activity is measured in one of a photometric and a colorimetric assay.

33. (new) The method of claim 21, wherein the dihydroorotase or the protein having the enzymatic activity of the dihydroorotase for identifying inhibitors of plant dihydroorotase is generated from the expression of a DNA sequence having a homology of at least 40% with SEQ ID NO: 1.

34. (new) The assay of claim 24, wherein the dihydroorotase or a protein having the enzymatic activity of a dihydroorotase, for identifying inhibitors of plant dihydroorotase, is

generated from the expression of a DNA sequence having a homology of at least 40% with SEQ ID NO: 1.